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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/787,060	02/25/2004	Akiyoshi Aoyagi	9319S-000659	9538
27572	7590	01/11/2006	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C.			NGUYEN, THINH T	
P.O. BOX 828			ART UNIT	PAPER NUMBER
BLOOMFIELD HILLS, MI 48303			2818	

DATE MAILED: 01/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/787,060	AOYAGI, AKIYOSHI
	Examiner Thinh T. Nguyen	Art Unit 2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on 03 November 2005.
- 2a) This action is **FINAL**.                                   2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-6 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 25 February 2004 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>2/25/04, 7/29/04, 3/4/05</u>	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

## **DETAILED OFFICE ACTION**

1. Applicant's election of claims 1-6 for prosecution without traverse in the communication with the Office on 11/03/2005 is acknowledged.

### **Specification**

2. The specification has been checked to the extent necessary to determine the presence of all possible minor errors. However, the applicant cooperation is requested in correcting any errors of which the applicant may become aware in the specification.

### **Claim Rejections - 35 USC § 102**

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102(a/b/e) that form the basis for the rejections under this section made in this office action.

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 1,2,5 are rejected under 35 U.S.C. 102(b/e) as being anticipated by Ahn et al. (U.S. Patent 6,274,937 ).

#### REGARDING CLAIM 1

Ahn ( in the abstract, in fig 4, column 8 lines 51-67, column 9 lines 1-24) discloses a semiconductor device, comprising: a first semiconductor package ( fig 4 package 10 ) that includes a first semiconductor chip ( fig 4 reference 108 ) ; a first protruding electrode ( the bottom electrode 118) bonded to the first semiconductor package; and a second semiconductor package( fig 4 package 120) that includes a second semiconductor chip ( fig 4 chip 140) , the second semiconductor package being mounted on the first semiconductor package via a second protruding electrode ( fig 4 electrode 126) , the second protruding electrode having a melting point which is higher than a melting point of the first protruding electrode.

Noted that bottom electrode 118 ( first protruding electrode of package 10 can use Eutectic solder Pb-62% Sn( column 9 line 7 ) Therefore it inherently has a lower melting point than electrode 126 of package 20.

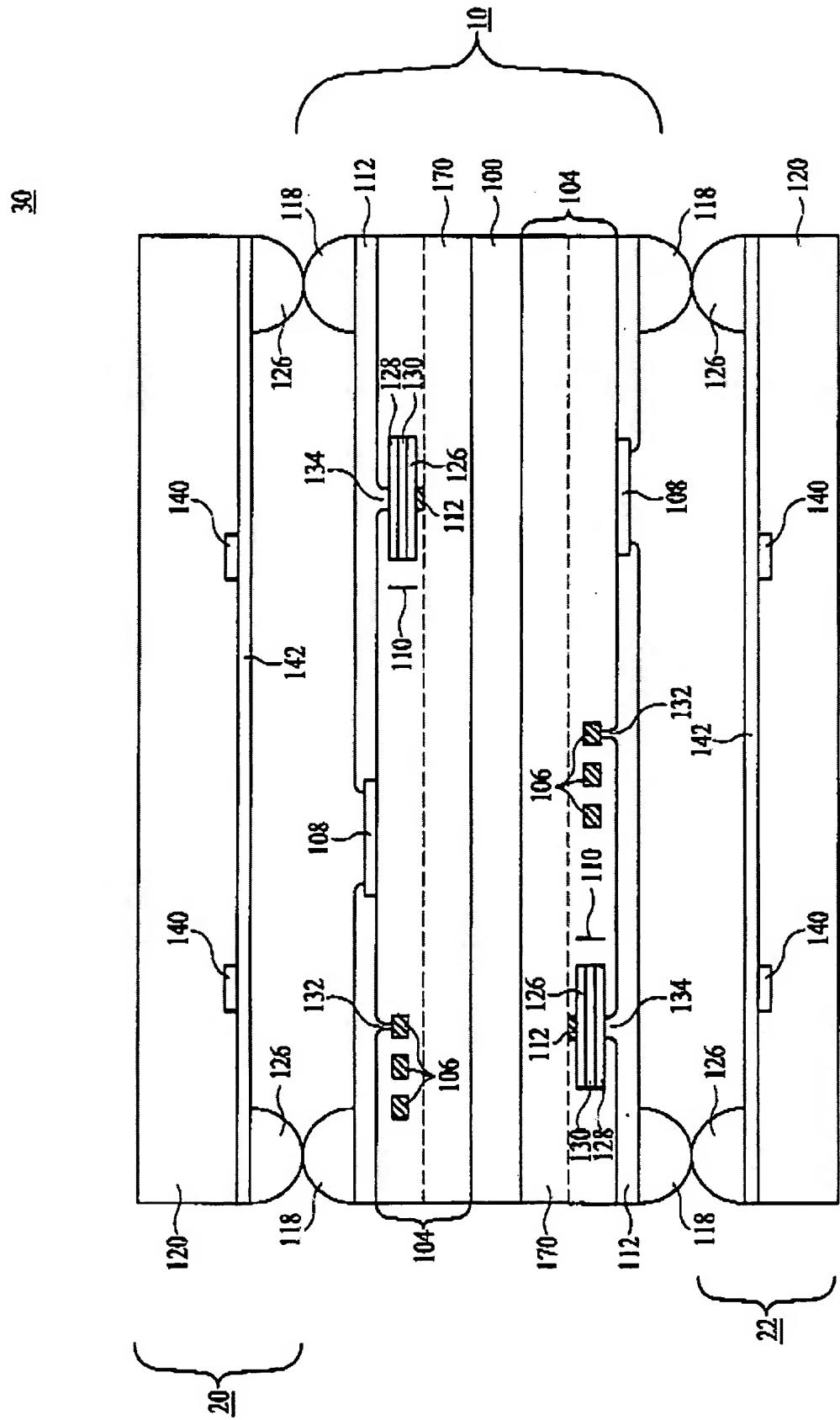


FIG. 4

**REGARDING CLAIM 2**

Ahn ( in the abstract, in fig 4, column 8 lines 51-67, column 9 lines 1-24) discloses a semiconductor device that includes a semiconductor on which the first semiconductor chip ( chip 108) is mounted.

**REGARDING CLAIM 5**

Ahn ( in the abstract, in fig 4, column 8 lines 51-67, column 9 lines 1-24) discloses an electronic device, comprising: a first package ( package 10 fig 4) that includes a first electronic part ( part 108) ; a first protruding electrode bonded to the first package( bottom electrode 118) ; and a second package ( package 20) that includes a second electronic part ( fig 4 reference 140), the second package being mounted on the first package via a second protruding electrode ( electrode 126) , the second protruding electrode having a melting point that is higher than a melting point of the first protruding electrode.

The logic why electrode 126 inherently has a higher melting point than bottom electrode 118 of package 10 has been discussed in the rejection of claim 1.

**Claim Rejections - 35 USC § 103**

5. The following is a quotation of U.S.C. 103(a) which form the basis for all obviousness rejections set forth in this office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ahn et al. ( U.S. patent 6,274,937) in view of further remark.

#### REGARDING CLAIM 3

Ahn ( in the abstract, in fig 4,column 8 lines 51-67, column 9 lines 1-24) discloses all the invention except for the detail that the semiconductor chip 108 is flip chip mounted on the substrate of package 10.

This feature, however, is considered obvious since it is a well-known technique in the art. A person skilled in the art at the time the invention was made would have been capable of mounting the chip 108 on the substrate of package 10 of the Ahn invention without any special instruction.

7. Claims 4,6 are rejected under Lee (US patent Application Publication US 2003/0042587) in view of further remark.

#### REGARDING CLAIM 4,6

Lee ( in fig 8,fig 20) discloses all the invention including first, second and third electrode. Missing in the disclosure by Lee is the different melting point for different electrodes, these features, however, are considered obvious since the melting temperature of different electrodes to suit the integration process of chip-on-chip package has become old and well known in the art as evidenced by the disclosure by Ahn (US patent 6,274,937 in fig 4,column 8 lines 51-67, column 9 lines 1-24).

A person skilled in the art at the time the invention was made would be capable of using the disclosure by Lee and his own design skill and come up with the invention of claim 4,6 since

it has been held that the provision of adjustability when needed involves only routine skill in the art.

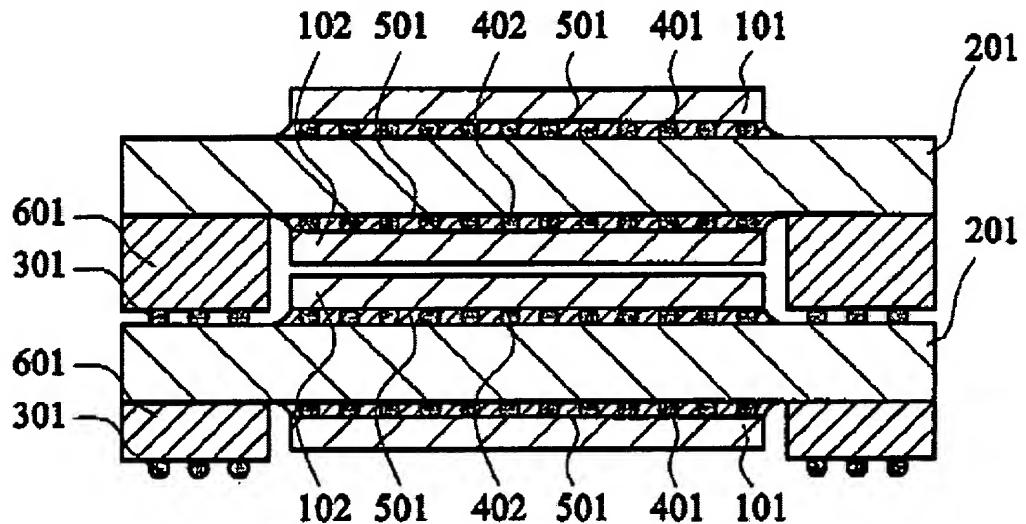


FIG 8

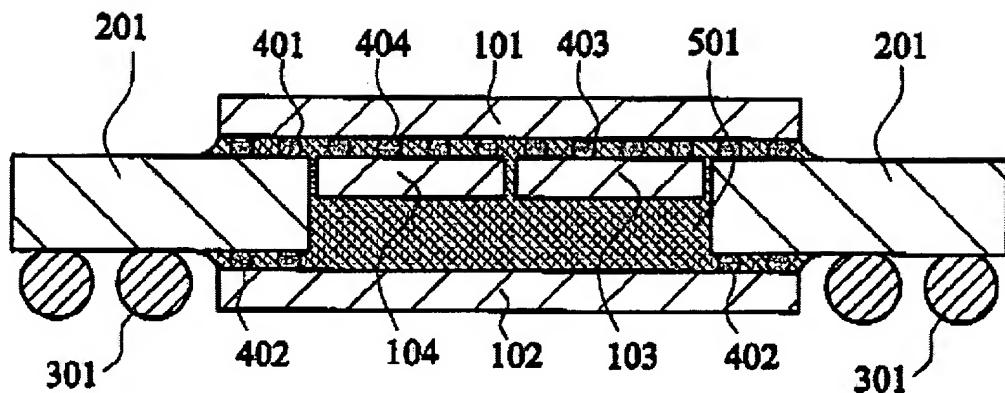


FIG 20

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8. When responding to the office action, Applicants are advised to provide the examiner with the line numbers and the page numbers in the application and/or references cited to assist the examiner to locate the appropriate paragraphs.

9. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to be abandoned (see M.P.E.P. 710.02(b)).

10. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d) which papers have been placed of record in the file.

## **CONCLUSION**

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thinh T Nguyen whose telephone number is 571-272-1790.

The examiner can normally be reached on Monday-Friday 9:30am-6: 30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached at 571-272-1787.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval [ PAIR ] system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thinh T. Nguyen

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A handwritten signature in black ink, appearing to read "Thinh T. Nguyen", is written over a horizontal line. Below the signature, another horizontal line extends from the left towards the right.